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DETERMINANTS OF CREDIT RISK OF ISLAMIC BANKING IN A DUAL BANKING SYSTEM: A CASE OF SELECTED MUSLIM COUNTRIES

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ABSTRAK

Tahap risiko kredit perbankan Islam telah menimbulkan kebimbangan kepada pihak berkuasa perbankan di kebanyakan negara Islam sejak beberapa tahun yang lalu. Oleh itu, kajian ini meneliti penentu risiko kredit perbankan Islam dalam sistem dwiperbankan yang merentasi negara bagi tempoh 2007 hingga 2015. Lag Autoregresif Teredar (ARDL) dan OLS Dinamik telah digunakan untuk menyiasat kewujudan hubungan jangka panjang antara risiko kredit bank-bank Islam dan pembolehubah khusus bank serta makroekonomi terpilih. Indeks Hirschman-Herfindahl (HHI) juga telah digunakan untuk menentukan tahap tumpuan pembiayaan oleh bank-bank. ARDL membuktikan wujudnya hubungan jangka panjang antara risiko kredit bank-bank Islam dan kadar faedah, pengembangan kredit, jurang pembiayaandeposit, pendapatan sebenar, bekalan wang, dan kadar pertukaran di Malaysia, Indonesia, dan Bahrain. Justeru, bukti-bukti ini menunjukkan bahawa faktor-faktor tersebut menerangkan risiko kredit bank-bank di negara-negara berkenaan dalam tempoh tersebut. Sementara itu, bukti daripada HHI dan OLS Dinamik juga mendedahkan kewujudan tumpuan pembiayaan oleh bank-bank Islam di Malaysia, Indonesia, dan Bahrain. Di samping itu, bukti-bukti yang seterusnya menunjukkan hubungan yang positif antara tumpuan pembiayaan dan risiko kredit bank-bank Islam di Malaysia dan Bahrain. Risiko yang wujud dalam tumpuan pembiayaan terutamanya dalam sektor isi rumah dan pengguna menunjukkan kehadiran *moral hazards* dalam pembiayaan bank Islam di negara-negara ini. Hasil kajian memberikan bukti lanjut kepada pengurusan bank-bank Islam dan pihak berkuasa tentang faktor-faktor yang perlu sentiasa dipantau dalam strategi pengurusan risiko kredit bank. Kefahaman tentang kewujudan *moral hazards* dalam tumpuan pembiayaan oleh bank-bank Islam juga dapat memberikan panduan kepada semua pihak yang berkepentingan.Ini bagi memastikan bahawa bank-bank bukan sahaja patuh syariah dalam operasi mereka tetapi juga memelihara kepentingan jangka panjang pemegang saham mereka dan seluruh kestabilan sistem kewangan.

Kata kunci:Risiko kredit, perbankan Islam, kointegrasi, dan *moral hazards*

ABSTRACT

The level of credit risk of Islamic banking has generated a great deal of concern to the banking regulatory authorities of many Muslim countries in the last few years.This study, therefore, examined the determinants of the credit risk of Islamic banking within the dual banking system of selected Muslim countries for the period 2007-2015. Autoregressive distributed lag (ARDL) and Dynamic OLS were employed to investigate the existence of a long-run relationship between the credit risk of Islamic banking and selected bank-specific and macroeconomic variables. Hirschman-Herfindahl-Index (HHI) was also employed to determine the level of financing concentration by the banks. Evidence from ARDL indicates the existence of a long-run relationship between the credit risk of Islamic banking and financing-deposit gap, real income, money supply, interest rates, credit expansion, and exchange rate in Malaysia, Indonesia and Bahrain. Similarly, evidence from HHI reveals the incidence of financing concentration by Islamic banks in these countries. Furthermore, evidence from Dynamic OLS indicates the existence of a long-run relationship between credit risk and financing concentration in Islamic banking in Malaysia and Bahrain.The inherent risk in financing concentration particularly in the household and consumer sectors indicates the presence of moral hazard in Islamic banking financing. The implication of the findings of the study suggests that the managements of Islamic banks and the relevant regulatory authorities need to further strengthen the existing credit risk management and monitoring strategies to prevent the incidence of the banking crisis and Islamic banking failure. The understanding of the existence of moral hazard in financing concentration will also guide relevant stakeholders in Islamic banking to ensure that banks are not only Sharia-compliant but also ensure optimum financing portfolio mix that can guarantee the long-run interest of their stakeholders and the overall financial system stability.

Keywords: Credit risk, Islamic banking, co-integration, moral hazard.

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CHAPTER ONE

INTRODUCTION

1.1 Background and Motivation of the Study

The crisis in the sub-prime housing market in the US which started in 2007 triggered the credit crunch and economic meltdown in the US and led to the global financial crisis of 2008. The crisis has far-reaching effects on the economies of many countries of the world (Dicevska, 2012; Probohudono, Tower & Rusmin, 2013; Rohit, 2008). Due to the intensity of its effects, it has been labeled the worst crisis since the Great Depression (Hengchao & Hamid, 2015; Smolo & Mirakhor, 2010). According to Rohit (2008), the bankruptcy of the Lehman Brothers in 2008 further deepened the financial crisis in the US. Rohit asserts further that it was the crisis that led to the takeover of Merrill Lynch by the Bank of America. Also, it was the same crisis that led the likes of Goldman Sachs and Morgan Stanley erstwhile, frontline investment bankers in the US, to transform into ordinary deposit-receiving banks. It took countries like the USA, China and EU billions of dollars of the bailout and liquidity injections to curtail impacts of the crisis (Md Zaber, 2012). According to Hengchao and Hamid (2015) the US subprime crisis, even though, started in the US, it spread to other countries, both developed and developing, as well. The crisis was precipitated by unwholesome practices in the credit market and the failure of the main vehicle of capitalism; free Market System with the doctrine of invisible hand mechanism (Moniruzzaman, 2014).

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REFERENCES

Acharya, V.V., Hassan, I. & Saunders, A. (2006). Should banks be diversified? Evidence from individual bank loan portfolios. *Journal of Business*, 79 (3) pp.1355-1412.

Adebola, S.S., Wan Yusoff, W.S. & Dahalan, J. (2011). An ARDL approach to determinants of non-performing loans in Islamic banking system in Malaysia. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 1 (2).

Affandi, A. & Tamanni, L. (2010). Monetary policy shocks and Islamic bank deposits in Indonesia dual banking system after the financial crisis. *(ICBE)*. 1 JFEKON.

Ahmad, N. H. & Ahmad, S.N. (2004). Key factors influencing credit risk of Islamic bank: A Malaysian case. *Journal of Muamalat and Islamic Finance Research –* JMIFR 1 (1), 1-10.

Ahmad, N. H.and Ariff, M. (2007). Multi – country study of bank credit risk determinants. *International Journal of Banking and Finance, 5 (1)*.

Akerlof, G. A. (2001). Behavioural macroeconomics and macroeconomics behaviour. *The American Economic Review, 92*, 411-433.

Akkizidis, I. & Khandelwal, S. K. (2008). *Financial risk management for Islamic banking and finance*. Palgrave: Macmillan.

Allen, F.& Santomero. A. M. (1998). The theory of financial intermediation. *Journal of Banking and Finance*, 21, pp.1461-1485.

Alom, M. M. & Haque, M.S. (2011). Marketing: An Islamic perspective. *World Journal of Social Sciences*, 1 (3), 71-81

Al-Samadi, M. O. (2010). Credit risk, macroeconomic and bank-specific factors in Jordanian Banks. *PhD Thesis*. Universiti Utara, Malaysia.

Al-Wesabi, H. A. H. & Ahmad, N. H. (2013). Credit risk of Islamic banks in GCC Countries. *International Journal of Banking and Finance,* 10, (2), 121-135

Al-Zuhayli, W. (2001). *Financial Transactions in Islamic jurisprudence* Vol. 1 Damascus, Dar Al-Fikr.

Amin, R. M. and Yusof, S. A. (2003). Allocative efficiency of profit maximisation: An Islamic perspective. *Review of Islamic Economics*(3), 5 – 21.

Anuar, K., Mohamad, S. & Eskandar Shah, M. (2014). Are deposit and Investment accounts in Islamic banks in Malaysia interest-free? *JKAU: Islamic Econ.,* 27 (2), 27-55.

Ariff, M. & Rosly, S. A. (2011). Islamic banking in Malaysia: Unchartered waters. *Asian Economic Policy Review,* 6, 301-319.

Ariffin, A. F. & Tafri, F. H (2014). The impact of financial risks on Islamic banks' Profitability. *International conference on business sociology and applied sciences,* Kuala Lumpur.

Armendariz, B. & Morduch, J. (2010). *Economics of microfinance*2nd Ed. The MIT Press.

Ascarya, H. H. & Achsani, N. A. (2008). Perilaku sistem moneter gandadi Indonesia. *Bulletin Ekonomicmoneter dan per Annan,* 11 (1).

Asteriou, D. & Hall, S. G. (2011). *Applied econometrics.* 2nd ed. Palgrave: Macmillan.

Azid, T., Asutay, M. & Burki (2007). Theory of the firm, management and Stakeholders: An Islamic perspective. *Islamic Economic Studies,*15 (1), 1-14.

Aziz, Z. A. (2002). Governor's special address at the 22nd Seminal for Central Banks and monetary agencies on AAOIFI'S accounting standards. Bank Negara Malaysia. Retrieved from *http: //www.bnm.org.my/index.pnp*

Bank Indonesia (2015). Islamic banking in Indonesia in brief. Sharia Banking, Financial System Stability. Retrieved from *http: // www.bi.go.id/en/per Annan/syrah*

Bank Negara Malaysia (2007). Classification and impairment provision for loans and financing (BNM/RH/GL007-17). Retrieved from http: // *www.bnm.org.my/index.pnp*

Bank Negara Malaysia (2013). Overview of Islamic finance in Malaysia. *Bank Negara Malaysia Financial Stability Report.*

Retrieved from http: // *www.bnm.org.my/index.pnp*

Bank Negara Malaysia (2013). FSA (2013) and IFSA (2013). Administered Legislation, Law, Policy & Guidelines.

Retrieved from http: // *www.bnm.org.my/index.pnp*

BCBS (2004). Principles for the management and supervision of interest Rate risk. Bank for International Settlement.

Behr, A., Kamp, A., Memmel, C. & Ptingston, A. (2007). Diversification and banks' risk – return – characteristics – evidence from loan portfolio of German banks. *Discussion Papers Series 2 Banking and Financial Studies No 05.* Deutsche Bundesbank. Eurosystem

Benston, G. J. & Kaufman, G. G (1995). The appropriate role of banking Regulations. *TheEconomic Journal,* (106). 688 – 607.

Berger, A. N. & De Young, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking and Finance,* 21, 1-28.

214

Berry, S., Harrison. R., Thomas, R.. & de Weymarn, L. (2007). Interpreting movements in Broad money. *Quarterly Bulletin Q3*, Bank of England, pp.376-386.

Boduri, L. (2014). Links between non-performing loan (NPL) and GDP growth – Case of Albania. *European Academic Research,* II (9), 11610-11623.

Bohn-Bawerk (1890). *Capital and Interest: A critical history of economic theory.* London: Macmillan & Co.

Bozovic, J. (2007). Business ethics in banking. FACTA UNIVERSITATIS Series: *Economics and organisation,* 4 (2), 173-182.

Butler, N. H. & Macey, J. R. (1988). The myth of competition in the dual Banking system. *Cornel Law Review,* 73 (4).

Calkins, S. (1993). The new merger guidelines and Herfindahl- Hirschman Index. *California Law Review,* 71 (2), pp. 402 429.

Castro, V. (2013). Macroeconomic determinants of credit risk in the banking System: The case of the GIPSI. *Economic Modeling,* 31, 672-683.

Central Bank of Bahrain: *CCB Rulebook 2. Laws and Regulations.* CCB

Cevik, S. & Charap, J. (2011). The behaviour of conventional and Islamic Bank Deposit returns in Malaysia and Turkey. *IMF Working Paper*WP/11/156. International Monetary Fund

Chapra, M. U. (1992). Islam and economic challenges. *The Islamic Foundation,* Leicester.

CCANB (2003). National banks and the dual banking system. Office of Comptroller of the Currency Administrator of National Banks.

Chusaini, A. & Ismal, R.(2013). Credit risk management in Indonesian   *Islamic*

   banks. AfroEuroasian Studies, 2 (1&2).

Das, A. & Ghosh, S. (2007). Determinants of credit risks in Indian State-owned

   banks: An empirical investigation. *MPRA Paper No 17301*. Retrieved from

   http:// mpra.ub.uni-muenchen.dee/17301

Dash, M. K. & Kabra, G. (2010). The determinants of nonperforming assets in Indian

   Commercial banks: An econometric study. *Middle Eastern Finance and*

   Economics, 7 pp.93-106.

De Alessi (1964). Do business firms gain from inflation? *The Journal of Business*, 37

   (2), 162-166.

Demirguc–Kunt, A. & Detragiache, E. (1998). The determinants of the banking crisis

   in Developing and developed countries. *IMF Staff Papers*, 45 (1). IMF

Diamond D.W. (1984). Financial intermediation and delegated monitoring *The*

   Review of Economics Studies, 51 (3). Oxford Univ. Press.

Dicevska, S. (2012). Credit risk-creating system of credit risk management in

   changing economic conditions in Macedonian banks. *Procedia Social And*

   *Behavioral Sciences,*44, 460-469.

di Florio, C. V. (2011). The role of compliance and ethics in risk management

   U.S.Securities and Exchange Commission.

Dow, J. (2000). What is a systemic risk? Moral hazard, initial shocks, and

   propagation. *Monetary and Economic Studies*. Bank of Japan.

Dusuki, A.W. (2008). What does Islam Say about corporate social responsibility

   (CSR)? *Review of Islamic Economics*, 12 (1), 5-28.

Elgari. M.A. (2003). Credit risk in Islamic banking and finance. *Islamic Economic Studies,*10 (2).

El-Hawary D.. Grais, W. & Iqbal, Z. (2004). Regulating Islamic Financial Institutions: The nature of the regulations. *Social Science Research Network (SSRN).*

Engle, R.F. & Granger, C. W. J. (1987). Cointegration and error correction: Representation, estimation, and testing, *Econometrica,* 55, pp. 251-276.

Ergec, E. H., & Kaytanci, B. G. (2014). The causality between returns of interest-based banks and Islamic banks: The case of Turkey. *International Journal of Islamic and Middle Eastern Finance and Management,* 17 (4), 443-456

Fama, E. F. & Jensen, M. C. (2003). Agency problems and residual claims. *Journal of Law and Economics, 26 (2), 327-349.*

Farhani, S., Shahbaz. M., Arouri, M. & Teulon, F. (2014). The role of natural gas consumption and trade in Tunisia's output. *Energy Policy,* 66, 677-684.

Fofack, H. (2005). Non-performing loans in Sub-Sharan Africa: Causal analysis and Macroeconomic implications. *World Bank Policy Research Working Paper* No 3769.

Gavin, M. & Hausmann, R. (1998). The roots of banking crises: The macroeconomic Context. *Inter-American Development Bank. Working Paper 318.*

Gujarati, D. N. (1992). *Essentials of econometrics*, 4th ed. McGraw-Hill.

Hanif, M. (2011). Differences and similarities in Islamic and conventional banking. *International Journal of Business and Social Sciences* 2 (2), pp. 166-175.

Haron, S. & Ahmad, N. (2000). The effects of conventional interest rates and rate of profit on funds deposited with Islamic banking in Malaysia. *International Journal of Islamic Financial Services,* 1 (4)

Haron, S. & Wan Azmi, W. N. (2008). Determinants of Islamic and conventional deposits in the Malaysian banking system. *Managerial Finance,* 34, (9), 618-643.

Hassan, M. & Dridi, J. (2010). The effects of the global crisis on Islamic and conventional Banks: A comparative study. *IMF Working Paper* No 10.

Hengchao, Z. & Hamid, Z. (2015).The impact of the subprime crisis on Asia-Pacific Islamic Markets. *Journal of Asia-Pacific Business* 16 (2). Pp.105-127.

Hellmann, T.F., Murdock, K. C. & Stiglitz, J. E. (2000). Liberalisation, moral hazard in banking, and prudential regulation: Are capital requirements enough? *The American Economic Review,* 90 (1), pp. 147-165.

Herring, R. J. & Watcher, S. (1999). Real estate booms and banking busts: An International perspective. *Wharton Financial Institutions Center.*

Hooks, L. M. & Robinson, K. J. (2002). Deposit insurance and moral hazard: Evidence from Texas banking in the 1920s. *The Journal of Economic History,* 62 (2) 833-853.

Iqbal, Z. & Mirakhor, A. (2004). Stakeholders model of governance in   Islamic economic system. *Islamic Economic Studies,* 11 (2).

Iqbal, Z. & Mirakhor, A. (2011). *An introduction to Islamic finance: Theory and Practice.* 2nd Ed. Wiley.

IFSB(2013). Non-performing financing in Islamic banks.*Islamic Financial Services Industry Stability Report,* pp. 41-42.

ISRA (2013). *Islamic financial system: Principles & operations.*2nd Print. International Shari'ah Research Academy for Islamic Finance. Kuala Lumpur.

Jackman, M. & Lorde, T. (2010). On the relationship between tourist flows and household expenditure in Barbados A Dynamic OLS Approach. *Economics Bulletin,* 30 (1).

Jaseviciene, F. (2012). The ethics of banking: Analysis and estimates. *EKONOMIKA*91 (3), 101-116

Jensen, M.C. & Meckling, W.H. (1979). Theory of the firm: Managerial behaviour, agency costs, and ownership structure. *Economics Social Institutions. Rochester Studies in Economics and Policy issues,* 1, 163-231.

Johansen, S. & Juselius, K. (1990). Maximum likelihood estimation and inference on Cointegration – with application to the demand for money. *Oxford Bulletin of Economics and Statistics,*52 (2), pp. 169-210.

Joint Forum (2015). Developments in credit risk management across Sectors: Current practices and recommendations. *Consultative Document.* Bank for International Settlements.

Kaleem, A. & Md Isa, M. (2003). The causal relationship between Islamic and Conventional banking instruments in Malaysia. *International Journal of Islamic Financial Services,* 4(4).

Kashif, I. & Mohammed, N. (2013). Determinants of bank credit in Pakistan: Supply-side approach. *Economic Modelling,* 35, 384-390.

Kasri, R. & Kassim, S. H. (2009). Empirical determinants of savings in the Islamic banking. Evidence from Indonesia. *J.K.A.U: Islamic Eco.* 22 (2), 3-23 SSRN

Kassim, S. H. & Abdul Manap, T. A. (2008). The information content of theIslamic interbank money market rate in Malaysia. *International Journal of Islamic and Middle Eastern Finance and Management,* 1 (4), 304-312.

Kassim, S. H., Majid, M. S. A. & Yusof, R. M. (2009). The impact of monetary policy shocks on the conventional and Islamic banks in a dual banking system: Evidence from Malaysia. *Journal of Economic Cooperation and Development,* 30 (1), 41-58.

Khan, T. & Ahmed, H. (2001). *Risk management: An analysis of issues in Islamic financial Industry,* Jeddah: IDB/IRTI Publisher.

Khan, M. M. & Bhatti, I. M. (2008). Islamic banking and finance: On its way to globalisation. *Managerial Finance,* 34 (10), 708-725.

Koch, T.W. (2003). *Bank management.* 3rd ed. Harcourt Brace College Publishers

Koch, T.W. & MacDonald, S. S. (2010). *Bank management.* 7th ed. South-Western Cengage Learning. USA

Laeven, L. (2011). Banking crises: A review. *The Annual Review of Economics.* 3:4.1-4.24.

Laldin, M. A. & Furqani, H. (2013). The foundations of Islamic finance and the Maqasid Al-shariah requirements. *Journal of Islamic Finance,* 2 (1), pp. 031-037.

Loayza, N. & Shankar, K. (2000). Private savings in India. *The World Bank Economic Review,* 14 (3), 571- 59.

Louzis, D. P., Vouldis, A.T. & Metaxas, V.L. (2012). Macroeconomic and bank-Specific determinants of non-performing loans in Greece. A comparative study

of the mortgage, business and consumer loan portfolio. *Journal of Banking and Finance,*36, 1012-1027.

Mansour, W., Ben Jedidia, K. & Majdoub, J. (2015). How ethical is Islamic banking in the Light of the objectives of Islamic laws? *Journal of Religious Ethics,* 3 (1).

Markowitz, H. M. (1952). Portfolio selection. *Journal of Finance,* 7, 77-91.

Markowitz, H. M. (1991). Foundations of portfolio theory. *Journal of Finance,* 46(2), 469 – 472.

Masih, R. & Masih, A. M. M. (1996). Stock-Watson dynamic OLS (DOLS). An error-correction modelling approach to estimating long- and short-run elasticities in a demand function: new evidence and methodologicalImplications from an application to the demand for coal in Mainland China. *Energy Economics,* 18, 315-334.

Masood, O., Al Suwaidi, H. & Thapa, P. D. P. (2012). Credit risk management: A case differentiating Islamic and non-Islamic banks In UAE. *Qualitative Research in Financial Markets,* 4 (2/3), 197-205.

Md Zaber (2012). The global financial crisis: Above and beyond. Retrieved from *http://www.academia.edu*

Metwally, M. M. (1997). Differences between the financial characteristics of Interest-free banks and conventional banks. *European Business Review,* 97 (2), 92 – 98.

Moniruzzaman (2014). Post-crisis political economy: Neoliberalism or Islamic Alternative? *Research in Applied Economics,* 6 (2), 157 – 170.

Naim, A. M. & Zainol, Z. (2015). *Islamic banking operations: Products and Services.* UUM Press. UUM, Sintok.

221

Narayan, P.K. & Smith, R. J. (2005). Trade liberalization and economic growth in Fiji: An empirical assessment using ARDL Approach. *Journal of Asia Pacific Economy*, 10 (1), pp. 96-115.

Nursechafia & Abduh, M. (2014). The susceptibility of Islamic banks' credit risk towards macroeconomic variables. *Journal of Islamic Finance*, 3 (1), pp. 023-037.

Obiyathulla, I. B. (2004). Dual banking systems and interest rate risk for Islamic banks. *MPRA (Munich Personal RePEc Archive)*, 1- 37.

Obiyathulla, I. B.(2008). The Islamic interbank money market and dual banking system: The Malaysian experience. *International Journal of Islamic and Middle Eastern Finance and Management*, 1 (3), 210-226.

Ozturk, I. & Acaravci, A. (2010). The causal relationship between energy consumption and GDP in Albania, Bulgaria, Hungary and Romania: Evidence from ARDL bound testing Approach. *Applied Energy*, 87, pp. 1938-1943.

Pesaran, M. H. & Shin, Y. (1999). An autoregressive distributed lag modelling approach to Cointegration analysis. In Strom S. (ed.), *Econometric and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium*, Cambridge Univ.Press: Cambridge.

Pesaran, M. H. & Shin, Y. & Smith, R. J. (2001). Bounds testing approaches to the Analysis of level relationships. *Journal of Applied Econometrics*, 16, pp. 289 326.

Perry, P. (1992). Do banks gain or lose from inflation. *Journal of Retail Banking*, 14 (2), 25-40.

Probohudono, A.N., Tower, G. & Rusmin, R. (2013). A risky tale of two Countries. *Asian Review of Accounting*, 21 (3), 257-272

Raji. J.O., Jusoh, J. & Jatan, M. (2014). Real money supply, price and fiscal deficit in Nigeria: Evidence from multivariate Granger causality tests. *Journal of Economic Cooperation and Development*, 35 (4) pp. 85-112.

Rizvi, W. & Sheheryar Khan, M. M. (2015). The impact of inflation on loan Default: A study on Pakistan. *Australian Journal of Business and Economic Studies*, (1), 87-94.

Rohit, P. B. (2008). Global financial crisis: Lesson in theory and policy. *The Maxist*, xxiv (3).

Rosly, S. A. & Zaini, M. A. M. (2008). Risk-return analysis of Islamic banks' investment deposits and shareholders' fund. *Managerial Finance*, 34 (10), 695-707.

Rossi, S. P. S., Schwaiger, M. S. & Winkler, G. (2009). How loan portfolio diversification affects risk, efficiency and capitalization: A managerial behaviour model of Austrian banks. *Journal of Banking & Finance*. 33, pp. 2218-2226.

Saikkonem, P. (1991). Asymptotically efficient estimation of cointegration regressions.*Econometric Theory*, 7, pp. 1-21.

Salas, J. S. & Salas-Fumas, V. (2002). Credit risk in two institutional regimes: Spanish commercial and savings banks. *Journal of Financial Services Research*, 22 (3).

Samad, A. & Hassan, K. (1999). The performance of Malaysian Islamic bank during 1984- 1997. An exploratory study. *International Journal of Islamic Financial Services*1 (3), pp. 1-14.

Santomero, A. M. (1997). Commercial banks risk management: An analysis of the process. *The Working Paper Series*. The Wharton Financial Institutions Center, Pennsylvania.

Sanwari, S. R. & Zakaria, R. H. (2013). The performance of Islamic banks and Macroeconomic conditions. ISRA, *International Journal of Islamic Finance*,5(2) 83- 98.

Saurina, J. & Jimenez, G. (2006). Credit cycles, credit risk and prudential Regulation. *International Journal of Central Banking*. Pp. 65-98.

Siddiqui, A. (2008). Financial contracts, risk and performance of IslamicBanking. *Managerial Finance*, 34 (10), 680-694.

Sinkey, J. F. Jr. & Greenawalt, M. B. (1991). Loan-loss experience and risk-taking behaviour at large commercial banks. *Journal of Financial Services Research*, 5, 43-59.

Smith, A. (1776). *An inquiry into the nature and causes of the wealth of Nations (The Wealth of Nations)*. Scotland: William Strahan, Thomas Cadell.

Smolo, E. & Mirakhor, A. (2010). The global financial crisis and its implications for the Islamic financial industry. *InternationalJournal of Islamic and Middle Eastern Finance Management*, 3(4), 372-385.

Stock, J. H. & Watson, M. (1993). A simple estimator f cointegrating vectors in higher order integrated systems. *Econometrica*, 61, pp. 783-820.

Sukmana, R. & Kassim, S. H. (2010). Roles of the Islamic banks in the monetary transmission process in Malaysia. *International Journal of Islamic and Middle Eastern Finance and Management*, 3 (1), 7-19.

Tabak, B. M., Fazio, D.M. & Cajueiro, D.O. (2010). The effects of loan Concentration on Brazilian banks' return and risk. *Working Paper Series* No 215. Banco Central Do Brazil pp. 1-46.

Tafri, F. H., AbdulRahman, R. & Hamid, Z. (2012). Sources of risk in commercial banks: Conventional vs Islamic banks. *British Journal of Economics, Finance and Management Sciences*, 4(2) 1-15.

Tahir, S. (2007). Islamic banking theory and practice: A survey and Bibliography of the 1995 – 2005 literature. *Journal of Economic Cooperation*, 28 (1), 1-72.

Takayasu Ito (2013). Islamic rates of return and conventional interest rates in the Malaysian deposit market. *International Journal of Islamic and Middle Eastern Finance and Management*, 6 (4), 290-303.

Tehulu, Y. A. & Olana, D. R. (2014). Bank-specific determinants of credit risk: Empirical evidence from Ethiopian banks. *Research Journal of Finance and Accounting*, 5 (7).

The Hadith. (pp. Sahih Al-Bukhari, vol. 4, Hadith No 28).

The Hadith. (pp. Sahih Muslim, Book 10, Hadith No 3854).

The Hadith. (pp. Sahih Muslim, Book 10, Hadith No 3882).

The Hadith. (pp. Sahih Muslim, Book 34, Hadith N6448).

Toda, H.Y. & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics* 66, pp. 225-250.

Winton, A. (1999). Don't put all your eggs in one basket? Diversification and specialisation in lending. *Working Paper 9903*, Finance Department, University of Minnesota, Minneapolis.

225

Wolde-Rufael, Y. (2005). Energy demand and economic growth: The African experience. *Journal of Policy Modeling*, 27, 891-903.

Wolfson, M. H. (2002). Minsky's theory of financial crises in a global context. *Journal Of Economic Issues*, XXXVI, (2). 393-400.

Yusof, S. A. & Amin, R. M. (2007). A survey on the objective of the firm and Models of producer behaviour in the Islamic framework. *J.K.A.U:Islamic Eco*, 20 (3), 3-16.

Zainol, Z. & Kassim, S. (2012). A critical review of the literature on the rate of return- risk in Islamic banks. *Journal of Islamic Accounting and Business Research*.3 (2),121- 137.

Appendix A:Results of Unit Root Tests

RESULTS OF UNIT ROOT TESTS (MALAYSIA)

CR

Null Hypothesis: CR has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.398412	0.5702
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(CR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.630914	0.0001
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

ROR

Null Hypothesis: ROR has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.439952	0.1394
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

Unit root test (MALAYSIA ctd)

Null Hypothesis: D(ROR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.747277	0.0079
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

IRD

Null Hypothesis: IRD has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.354896	0.1625
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(IRD) has a unit root
Exogenous: Constant
Lag Length: 8 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.354275	0.0002
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

*MacKinnon (1996) one-sided p-values.

Unit root test (MALAYSIActd)

LRM

Null Hypothesis: LRM has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.753961	0.8188
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LRM) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.022815	0.0003
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

LGDP

Null Hypothesis: LGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.006528	0.7394
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Unit root test (MALAYSIA ctd)

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.308613	0.0001
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

FDR
Null Hypothesis: FDR has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.374735	0.9020
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(FDR) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.765573	0.0006
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Unit root test (MALAYSIA ctd)

EXC
Null Hypothesis: EXC has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.688202	0.8361
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(EXC) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.379733	0.0016
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

RESULTS OF UNIT ROOT TESTS (INDONESIA)

ROR
Null Hypothesis: ROR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.059354	0.2615
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

RESULTS OF UNIT ROOT TESTS (INDONESIA) ctd

Null Hypothesis: D(ROR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.077066	0.0002
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

IRD

Null Hypothesis: IRD has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.587217	0.0118
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

LRM

Null Hypothesis: LRM has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.507054	0.1236
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LRM) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.766713	0.0007
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

LGDP

Null Hypothesis: LGDP has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.120166	0.9620
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.938290	0.0000
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

RESULTS OF UNIT ROOT TESTS (BAHRAIN)

CR
Null Hypothesis: CR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.227240	0.6507
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(CR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.664815	0.0007
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

ROR
Null Hypothesis: ROR has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.500738	0.1253
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

RESULTS OF UNIT ROOT TESTS (BAHRAIN) ctd

Null Hypothesis: D(ROR) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.328042	0.0000
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

IRD

Null Hypothesis: IRD has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.688939	0.0006
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

LRM

Null Hypothesis: LRM has a unit root
Exogenous: Constant
Lag Length: 7 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.099516	0.0040
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

*MacKinnon (1996) one-sided p-values.

RESULTS OF UNIT ROOT TESTS (BAHRAIN) ctd

LGDP
Null Hypothesis: LGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.568965	0.8643
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.864698	0.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

FDR

Null Hypothesis: FDR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.047633	0.2662
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

RESULTS OF UNIT ROOT TESTS (BAHRAIN) ctd

Null Hypothesis: D(FDR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.730437	0.0006
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

EXC

Null Hypothesis: EXC has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.214574	0.9695
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(EXC) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.784511	0.0072
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

Appendix B: ARDLCointegration Results

ARDLCointegration result (MALAYSIA)

Results of Bound tests

ROR model

ARDL Bounds Test
Date: 08/19/16   Time: 19:29
Sample: 2007Q4 2015Q2
Included observations: 31
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	**5.130393**	**3**

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

ARDL Cointegration and long-run coefficients

ARDL Cointegrating And Long Run Form
Dependent Variable: ROR
Selected Model: ARDL(2, 0, 3, 3)
Date: 08/19/16   Time: 19:29
Sample: 2007Q1 2015Q2
Included observations: 31

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROR(-1))	-0.411910	0.200920	-2.050121	0.0544
D(IRD)	0.111362	0.075137	1.482125	0.1547
D(LRM)	-0.945042	0.531838	-1.776937	0.0916
D(LRM(-1))	-0.294493	0.705093	-0.417666	0.6809
D(LRM(-2))	1.204032	0.498204	2.416745	0.0259
D(LGDP)	1.850061	0.389110	4.754590	0.0001
D(LGDP(-1))	0.465839	0.422378	1.102896	0.2838
D(LGDP(-2))	0.670340	0.367747	1.822828	0.0841
CointEq(-1)	-0.223679	0.117268	-1.907417	0.0717

Cointeq = ROR - (0.4979*IRD -5.0095*LRM + 7.3633*LGDP -42.6224
)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IRD	0.497867	0.177059	2.811867	0.0111
LRM	-5.009532	3.035214	-1.650471	0.1153
LGDP	7.363298	4.263410	1.727091	0.1004
C	-42.622435	24.337884	-1.751279	0.0960

Diagnostic test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.860910	Prob. F(1,16)	0.3673
Obs*R-squared	1.531786	Prob. Chi-Square(1)	0.2158

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.595604	Prob. F(11,19)	0.8097
Obs*R-squared	7.948642	Prob. Chi-Square(11)	0.7179
Scaled explained SS	1.512303	Prob. Chi-Square(11)	0.9996

MODEL STABILITY TEST (CUSUM TEST)

CUSUM of SQUARES

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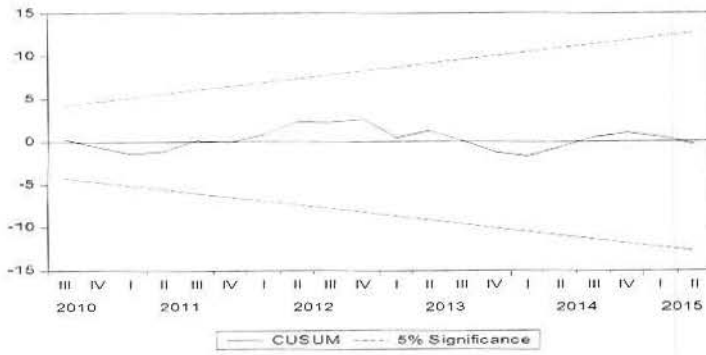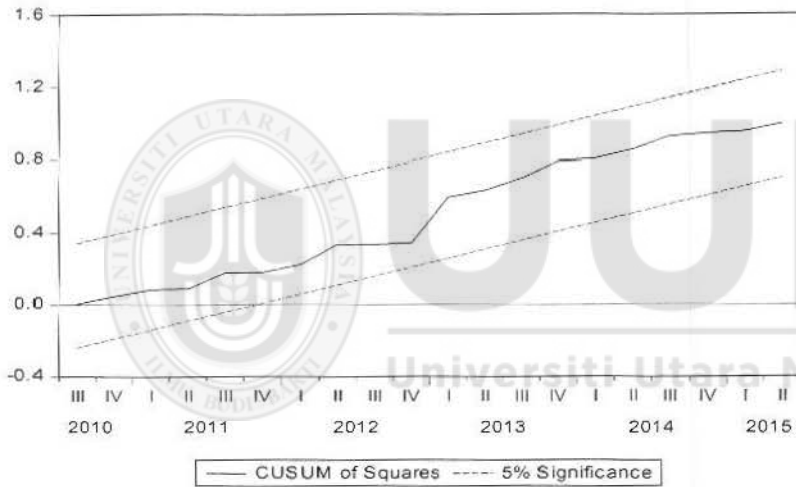
Toda-Yamamoto Causality test

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 08/26/16   Time: 09:22
Sample: 2007Q1 2015Q2
Included observations: 30

Dependent variable: ROR

Excluded	Chi-sq	df	Prob.
IRD	11.27605	3	0.0103
LRM	4.186870	3	0.2420
LGDP	3.711876	3	0.2943
All	14.73879	9	0.0984

Dependent variable: IRD

Excluded	Chi-sq	df	Prob.
ROR	8.534421	3	0.0362
LRM	1.404239	3	0.7045
LGDP	2.286498	3	0.5151
All	9.670414	9	0.3778

Dependent variable: LRM

Excluded	Chi-sq	df	Prob.
ROR	22.69680	3	0.0000
IRD	7.627230	3	0.0544
LGDP	14.64174	3	0.0021
All	32.51963	9	0.0002

Dependent variable: LGDP

Excluded	Chi-sq	df	Prob.
ROR	7.194750	3	0.0659
IRD	2.652796	3	0.4483
LRM	1.276121	3	0.7348
All	18.39660	9	0.0308

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ARDL Cointegration and long-run coefficients (INDONESIA)

ARDL Cointegrating And Long Run Form
Dependent Variable: ROR
Selected Model: ARDL(1, 1, 3, 1)
Date: 08/20/16   Time: 16:29
Sample: 2007Q1 2015Q2
Included observations: 31

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IRD)	-0.315376	0.242280	-1.301704	0.2078
D(LRM)	0.234504	0.595317	0.393914	0.6978
D(LRM(-1))	0.381560	0.685036	0.556993	0.5837
D(LRM(-2))	0.993528	0.675304	1.471231	0.1568
D(LGDP)	0.580216	6.404663	0.090593	0.9287
D(@TREND())	-0.197346	0.131172	-1.504486	0.1481
CointEq(-1)	-0.568956	0.164796	-3.452481	0.0025

Cointeq = ROR - (0.2957*IRD -2.3662*LRM + 31.4707*LGDP -393.9571
-0.3469*@TREND)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IRD	0.295723	0.155092	1.906750	0.0710
LRM	-2.366222	0.902368	-2.622235	0.0163
LGDP	31.470709	17.562239	1.791953	0.0883
C	-393.957143	229.170178	-1.719059	0.1010
@TREND	-0.346857	0.238728	-1.452935	0.1618

Results of Bound tests (ROR model)

ARDL Bounds Test
Date: 08/20/16   Time: 16:30
Sample: 2007Q4 2015Q2
Included observations: 31
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.858307	3

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	3.47	4.45
5%	4.01	5.07
2.5%	4.52	5.62
1%	5.17	6.36

Diagnostic tests

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.809674	Prob. F(1,19)	0.3795
Obs*R-squared	1.267052	Prob. Chi-Square(1)	0.2603

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.376134	Prob. F(10,20)	0.2600
Obs*R-squared	12.63580	Prob. Chi-Square(10)	0.2448
Scaled explained SS	4.234830	Prob. Chi-Square(10)	0.9361

MODEL STABILITY TEST (CUSUM TEST)
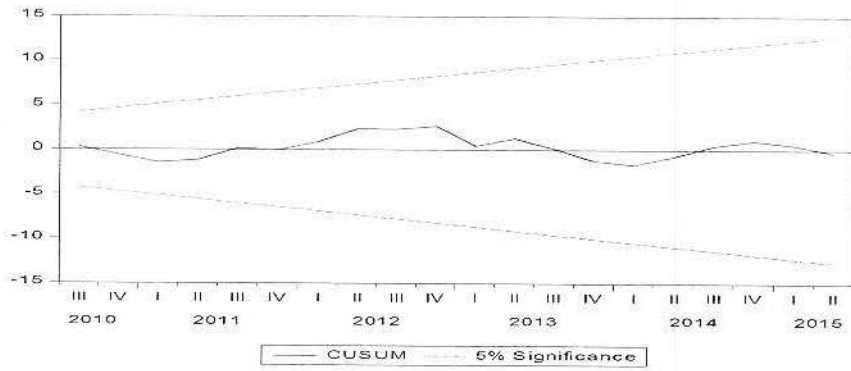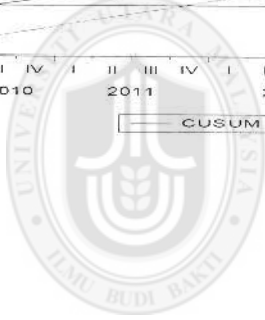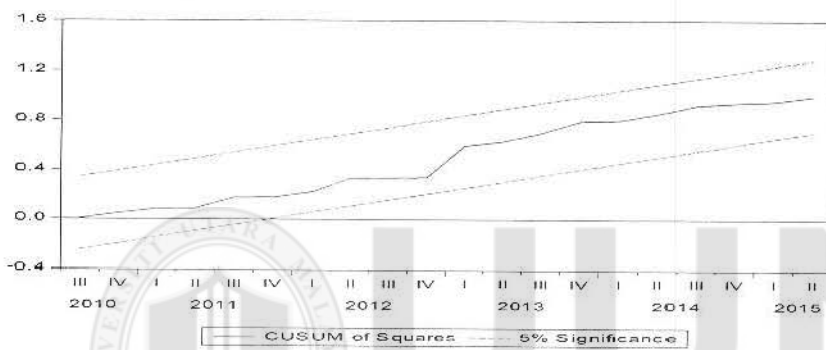
CUSUM of SQUARES

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CAUSALITY TEST

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 08/26/16   Time: 10:31
Sample: 2007Q1 2015Q2
Included observations: 28

Dependent variable: ROR

Excluded	Chi-sq	df	Prob.
IRD	9.371558	5	0.0951
LRM	9.117829	5	0.1045
LGDP	6.006167	5	0.3056
All	20.21616	15	0.1638

Dependent variable: IRD

Excluded	Chi-sq	df	Prob.
ROR	6.173707	5	0.2897
LRM	4.019136	5	0.5467
LGDP	11.44609	5	0.0432
All	62.02268	15	0.0000

Dependent variable: LRM

Excluded	Chi-sq	df	Prob.
ROR	16.59064	5	0.0053
IRD	21.60996	5	0.0006
LGDP	16.85656	5	0.0048
All	37.64258	15	0.0010

Dependent variable: LGDP

Excluded	Chi-sq	df	Prob.
ROR	4.400459	5	0.4933
IRD	3.554299	5	0.6152
LRM	3.801864	5	0.5783
All	8.933043	15	0.8810

BAHRAIN

ARDL Cointegrating And Long Run Form
Dependent Variable: ROR
Selected Model: ARDL(4, 0, 0, 3)
Date: 09/30/16   Time: 10:00
Sample: 2007Q1 2015Q2
Included observations: 30

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROR(-1))	-0.023773	0.178961	-0.132837	0.8957
D(ROR(-2))	-0.292361	0.149986	-1.949250	0.0662
D(ROR(-3))	-0.439945	0.141392	-3.111535	0.0057
D(IR)	0.484839	0.206898	2.343372	0.0301
D(LGDP)	0.965478	0.468894	2.059055	0.0535
D(LRM)	2.172395	4.533050	0.479235	0.6372
D(LRM(-1))	-0.733235	4.917865	-0.149096	0.8830
D(LRM(-2))	9.127176	3.398889	2.685341	0.0146
CointEq(-1)	-0.892721	0.219784	-4.061811	0.0007

Cointeq = ROR - (0.5431*IR + 1.0815*LGDP -1.9099*LRM -0.8668)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR	0.543103	0.240808	2.255332	0.0361
LGDP	1.081500	0.545334	1.983187	0.0620
LRM	-1.909923	2.705260	-0.706004	0.4888
C	-0.866764	12.048945	-0.071937	0.9434

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.210265	Prob. F(1,18)	0.6520
Obs*R-squared	0.346394	Prob. Chi-Square(1)	0.5562

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.450280	Prob. F(10,19)	0.2328
Obs*R-squared	12.98650	Prob. Chi-Square(10)	0.2244
Scaled explained SS	8.740116	Prob. Chi-Square(10)	0.5569

MODEL STABILITY TEST (CUSUM TEST)
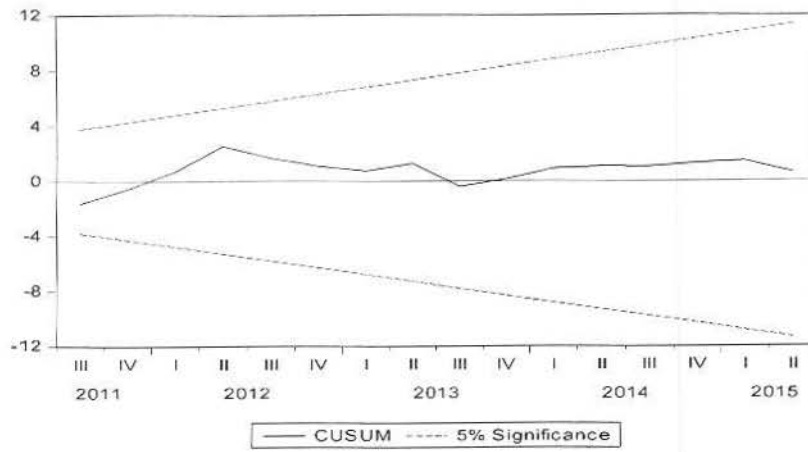
CUSUM of SQUARES
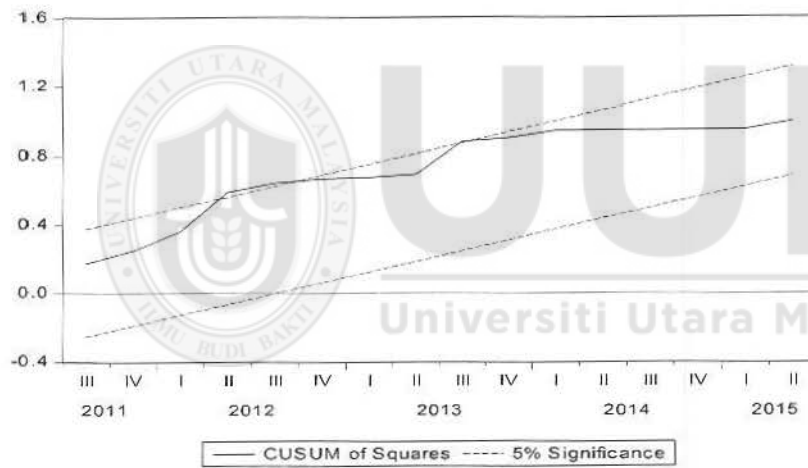
Appendix C: Islamic banks' Deposit-Interest Rate Model

Islamic banks' deposit-Interest rate model

ARDL Cointegration tests results (MALAYSIA)

Bound Test

ARDL Bounds Test
Date: 08/29/16   Time: 22:59
Sample: 2008Q1 2015Q2
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	11.94867	3

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	3.47	4.45
5%	4.01	5.07
2.5%	4.52	5.62
1%	5.17	6.36

ARDL Cointegrating And Long Run Form
Dependent Variable: LDP
Selected Model: ARDL(3, 4, 4, 2)
Date: 08/29/16   Time: 22:59
Sample: 2007Q1 2015Q2
Included observations: 30

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDP(-1))	-0.028003	0.147473	-0.189885	0.8526
D(LDP(-2))	0.176660	0.126904	1.392073	0.1892
D(ROR)	0.089024	0.049484	1.799050	0.0972
D(ROR(-1))	-0.224322	0.061456	-3.650155	0.0033
D(ROR(-2))	0.154248	0.047529	3.245372	0.0070
D(ROR(-3))	-0.127072	0.040937	-3.104067	0.0091
D(IRD)	0.000740	0.028415	0.026039	0.9797
D(IRD(-1))	-0.094791	0.027971	-3.388905	0.0054
D(IRD(-2))	0.067499	0.024345	2.772595	0.0169
D(IRD(-3))	0.038952	0.042222	0.922531	0.3744
D(LGDP)	-0.275462	0.221707	-1.242457	0.2378
D(LGDP(-1))	0.567521	0.151112	3.755629	0.0027
D(@TREND())	0.039212	0.008457	4.636516	0.0006
CointEq(-1)	-0.877880	0.184154	-4.767110	0.0005

Cointeq = LDP - (0.2559*ROR -0.1907*IRD -0.2706*LGDP + 14.7034 +
    0.0447*@TREND)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROR	0.255896	0.079872	3.203826	0.0076
IRD	-0.190725	0.051100	-3.732367	0.0029
LGDP	-0.270619	0.337520	-0.801787	0.4383
C	14.703367	3.938456	3.733282	0.0029
@TREND	0.044666	0.005708	7.825683	0.0000

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.307158	Prob. F(1,11)	0.5905
Obs*R-squared	0.814948	Prob. Chi-Square(1)	0.3667

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.493471	Prob. F(17,12)	0.9108
Obs*R-squared	12.34342	Prob. Chi-Square(17)	0.7789
Scaled explained SS	1.781829	Prob. Chi-Square(17)	1.0000

MODEL STABILITY TEST (CUSUM TEST)

CUSUM ——— 5% Significance

CUSUM of SQUARES
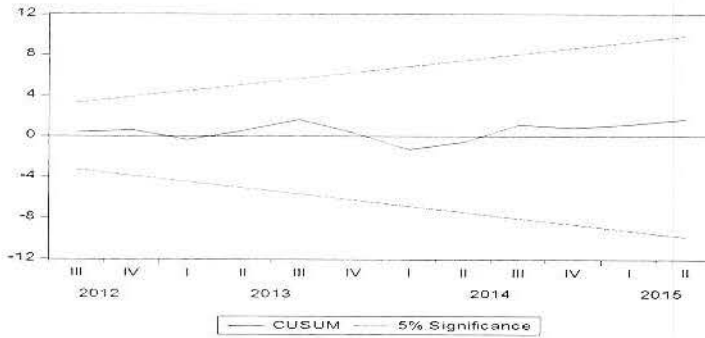
CUSUM of Squares ——— 5% Significance
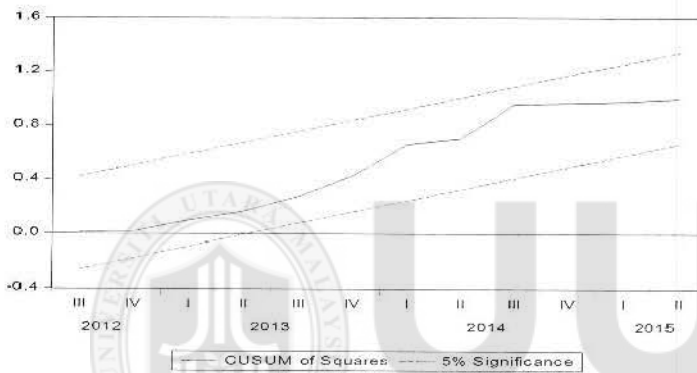
INDONESIA

ARDL Bounds Test
Date: 08/30/16   Time: 11:11
Sample: 2007Q4 2015Q2
Included observations: 31
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	8.668462	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

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ARDL Cointegrating And Long Run Form
Dependent Variable: LDP
Selected Model: ARDL(2, 2, 0, 3, 3)
Date: 08/30/16   Time: 11:13
Sample: 2007Q1 2015Q2
Included observations: 31

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDP(-1))	0.612552	0.198676	3.083173	0.0071
D(ROR)	-0.023426	0.010003	-2.341873	0.0325
D(ROR(-1))	0.058891	0.011467	5.135720	0.0001
D(IRD)	-0.029526	0.007390	-3.995142	0.0010
D(LGDP)	0.200987	0.364738	0.551044	0.5892
D(LGDP(-1))	0.049707	0.512733	0.096944	0.9240
D(LGDP(-2))	-1.677468	0.424447	-3.952129	0.0011
D(INF)	0.006033	0.004189	1.440085	0.1691
D(INF)	-0.002140	0.006696	-0.319607	0.7534
D(INF)	-0.012704	0.005700	-2.228960	0.0405
CointEq(-1)	-0.908129	0.212583	-4.271877	0.0006

Cointeq = LDP - (-0.0742*ROR -0.0325*IRD + 5.1315*LGDP -0.0119*INF
-56.0836)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROR	-0.074187	0.008464	-8.765447	0.0000
IRD	-0.032512	0.004771	-6.814624	0.0000
LGDP	5.131452	0.081799	62.732544	0.0000
INF	-0.011886	0.004276	-2.779709	0.0134
C	-56.083591	1.155080	-48.553878	0.0000

DIAGNOSTIC TESTS

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.048786	Prob. F(1,15)	0.8282
Obs*R-squared	0.100497	Prob. Chi-Square(1)	0.7512

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.352869	Prob. F(14,16)	0.9717
Obs*R-squared	7.313458	Prob. Chi-Square(14)	0.9220
Scaled explained SS	1.496227	Prob. Chi-Square(14)	1.0000

MODEL STABILITY TEST (CUSUM TEST)
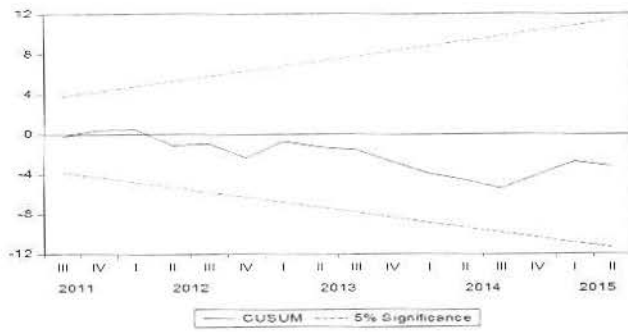
CUSUM of SQUARES
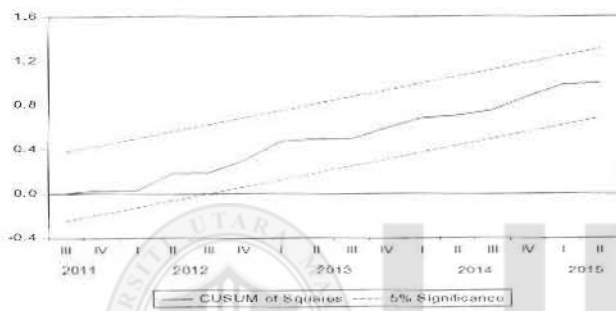
BAHRAIN

ARDL Bounds Test
Date: 08/31/16   Time: 08:18
Sample: 2007Q4 2015Q2
Included observations: 31
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	6.121260	3

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	3.47	4.45
5%	4.01	5.07
2.5%	4.52	5.62
1%	5.17	6.36

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ARDL Cointegrating And Long Run Form
Dependent Variable: LDP
Selected Model: ARDL(3, 0, 1, 0)
Date: 08/31/16   Time: 08:22
Sample: 2007Q1 2015Q2
Included observations: 31

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDP(-1))	0.126158	0.157127	0.802903	0.4306
D(LDP(-2))	0.256926	0.155867	1.648361	0.1135
D(ROR)	0.026014	0.012472	2.085824	0.0488
D(IRD)	-0.068635	0.037530	-1.828792	0.0810
D(LGDP)	0.124647	0.050385	2.473895	0.0216
D(@TREND())	-0.006883	0.002667	-2.580454	0.0171
CointEq(-1)	-0.595391	0.124046	-4.799761	0.0001

Cointeq = LDP - (0.0437*ROR -0.2558*IRD + 0.2094*LGDP + 8.4699
    -0.0116*@TREND)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROR	0.043692	0.024165	1.808080	0.0843
IRD	-0.255818	0.054695	-4.677191	0.0001
LGDP	0.209353	0.086685	2.415090	0.0245
C	8.469893	0.565599	14.975095	0.0000
@TREND	-0.011560	0.004597	-2.514753	0.0197

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.085729	Prob. F(1,21)	0.7726
Obs*R-squared	0.126038	Prob. Chi-Square(1)	0.7226

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.489166	Prob. F(8,22)	0.8508
Obs*R-squared	4.681495	Prob. Chi-Square(8)	0.7910
Scaled explained SS	7.264243	Prob. Chi-Square(8)	0.5084

MODEL STABILITY TEST (CUSUM TEST)
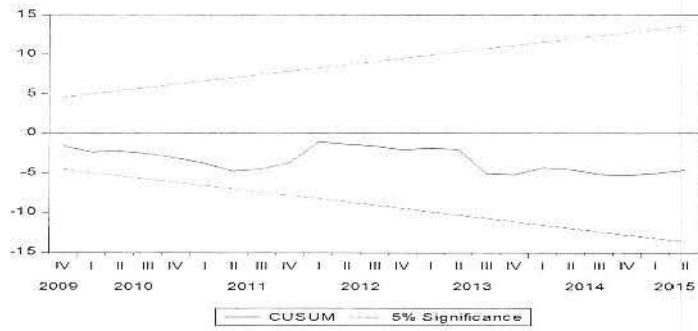
CUSUM of SQUARES
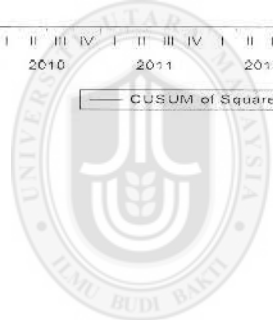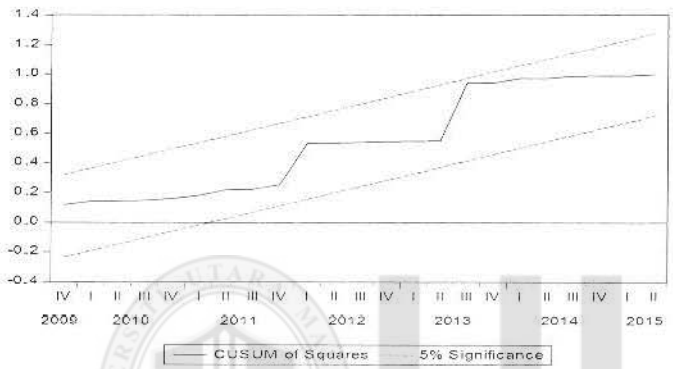
Appendix D: Financing-Deposit Gap and Credit Risks

Financing-Deposit gap and credit risks (Malaysia)

ARDL Cointegrating And Long Run Form
Dependent Variable: CR
Selected Model: ARDL(2, 4, 4, 4, 3)
Date: 09/20/16   Time: 10:06
Sample: 2007Q1 2015Q2
Included observations: 30

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CR(-1))	0.493080	0.365233	1.350043	0.2140
D(FDR)	0.616600	0.927656	0.664685	0.5249
D(FDR(-1))	-2.400582	1.175292	-2.042540	0.0754
D(FDR(-2))	0.854986	0.697589	1.225631	0.2552
D(FDR(-3))	-2.683320	1.750578	-1.532819	0.1639
D(LGDP)	0.555874	0.465823	1.193316	0.2669
D(LGDP(-1))	-0.010954	0.843107	-0.012992	0.9900
D(LGDP(-2))	-0.344424	0.847297	-0.406497	0.6950
D(LGDP(-3))	1.828885	0.725076	2.522337	0.0357
D(LRM)	3.180287	1.087761	2.923699	0.0192
D(LRM(-1))	-1.934554	1.182013	-1.636660	0.1403
D(LRM(-2))	2.593345	1.080295	2.400590	0.0431
D(LRM(-3))	1.511924	1.048720	1.441686	0.1874
D(EXC)	-0.234481	0.264344	-0.887029	0.4009
D(EXC(-1))	-0.890713	0.404874	-2.199978	0.0590
D(EXC(-2))	0.660990	0.285329	2.316592	0.0492
CointEq(-1)	-0.987910	0.322272	-3.065456	0.0155

Cointeq = CR - (4.1165*FDR -1.3114*LGDP -2.4485*LRM -0.0623*EXC + 37.2597)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDR	4.116528	1.953340	2.107431	0.0681
LGDP	-1.311400	1.078988	-1.215398	0.2589
LRM	-2.448471	0.610349	-4.011595	0.0039
EXC	-0.062305	0.347582	-0.179253	0.8622
C	37.259697	8.626423	4.319252	0.0025

ARDL Bounds Test
Date: 09/20/16   Time: 10:07
Sample: 2008Q1 2015Q2
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.079450	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.220258	Prob. F(1,7)		0.6531
Obs*R-squared	0.915166	Prob. Chi-Square(1)		0.3387

Heteroskedasticity Test: ARCH

F-statistic	0.246570	Prob. F(1,27)		0.6235
Obs*R-squared	0.262437	Prob. Chi-Square(1)		0.6085
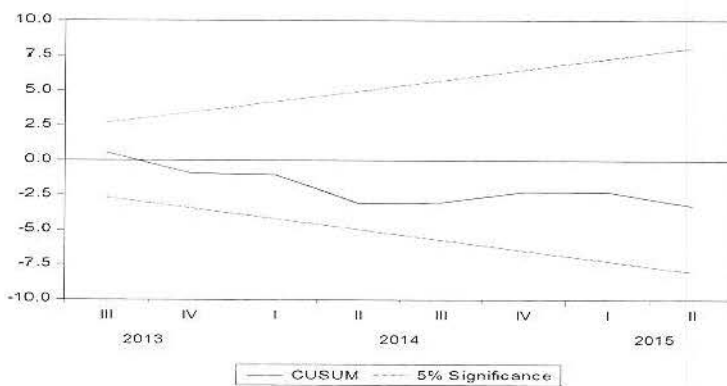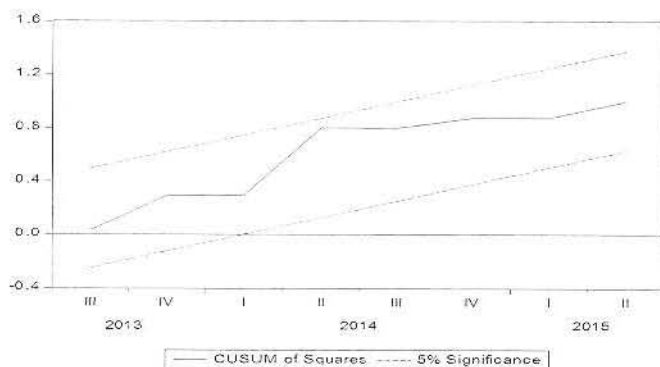
CUSUM ---- 5% Significance

CUSUM of Squares ----- 5% Significance

VAR Lag Order Selection Criteria
Endogenous variables: CR FDR LGDP LRM EXC
Exogenous variables: C
Date: 09/18/16   Time: 11:15
Sample: 2007Q1 2015Q2
Included observations: 30

Lag	LogL	LR	FPE	AIC	SC	HQ
0	145.6310	NA	5.83e-11	-9.375401	-9.141868	-9.300692
1	265.1462	191.2244	1.10e-13	-15.67642	-14.27522*	-15.22816
2	278.8407	17.34629	2.72e-13	-14.92271	-12.35385	-14.10091
3	318.3089	36.83705	1.60e-13	-15.88726	-12.15074	-14.69192
4	385.2644	40.17328*	2.82e-14*	-18.68429*	-13.78010	-17.11540*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 09/18/16   Time: 11:27
Sample: 2007Q1 2015Q2
Included observations: 32

Dependent variable: CR

Excluded	Chi-sq	df	Prob.
FDR	7.230968	2	0.0269
LGDP	11.10543	2	0.0039
LRM	9.144015	2	0.0103
EXC	15.11464	2	0.0005
All	33.88394	8	0.0000

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Dependent variable: FDR

Excluded	Chi-sq	df	Prob.
CR	3.373555	2	0.1851
LGDP	0.106572	2	0.9481
LRM	1.168290	2	0.5576
EXC	1.226481	2	0.5416
All	12.99324	8	0.1121

Dependent variable: LGDP

Excluded	Chi-sq	df	Prob.
CR	4.744821	2	0.0933
FDR	5.145170	2	0.0763
LRM	2.674911	2	0.2625
EXC	2.631341	2	0.2683
All	11.40516	8	0.1798

Dependent variable: LRM

Excluded	Chi-sq	df	Prob.
CR	0.768197	2	0.6811
FDR	1.014463	2	0.6022
LGDP	6.191379	2	0.0452
EXC	0.732862	2	0.6932
All	11.98719	8	0.1518

Dependent variable: EXC

Excluded	Chi-sq	df	Prob.
CR	0.264067	2	0.8763
FDR	0.032484	2	0.9839
LGDP	0.059221	2	0.9708
LRM	0.004473	2	0.9978
All	2.795468	8	0.9465

INDONESIA

ARDL Bounds Test
Date: 09/18/16   Time: 17:20
Sample: 2008Q1 2015Q2
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k	
F-statistic	7.782504	4	

Critical Value Bounds

Significance	I0 Bound	I1 Bound	
10%	2.45	3.52	
5%	2.86	4.01	
2.5%	3.25	4.49	
1%	3.74	5.06	

Heteroskedasticity Test: ARCH

F-statistic	1.883192	Prob. F(1,27)	0.1813
Obs*R-squared	1.890808	Prob. Chi-Square(1)	0.1691

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.394320	Prob. F(1,5)	0.5576
Obs*R-squared	2.192965	Prob. Chi-Square(1)	0.1386
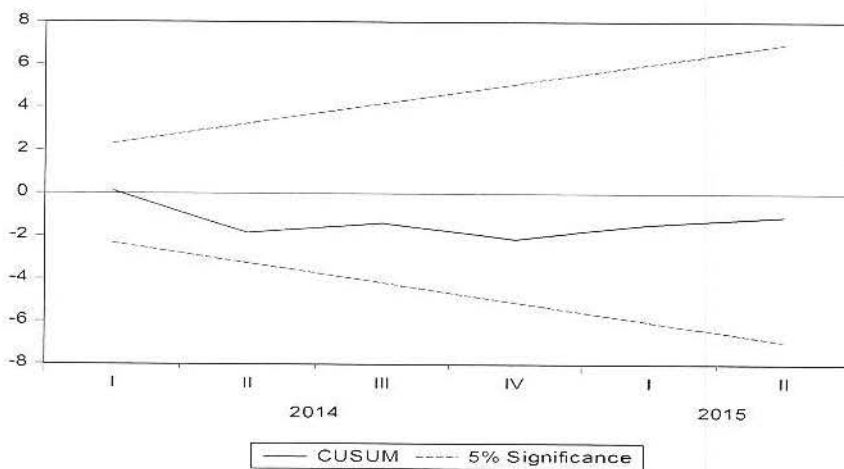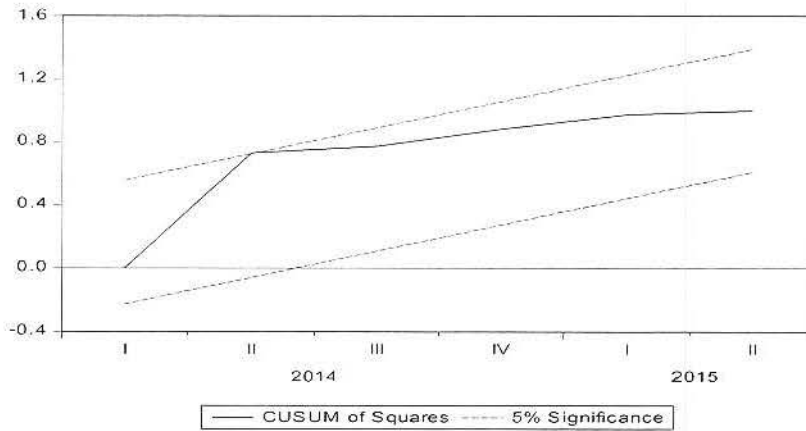
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CUSUM of Squares ----- 5% Significance

VAR Lag Order Selection Criteria
Endogenous variables: CR FDR LGDP LRM EXC
Exogenous variables: C
Date: 09/18/16   Time: 17:26
Sample: 2007Q1 2015Q2
Included observations: 30

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-359.2694	NA	24230.45	24.28463	24.51816	24.35934
1	-243.1313	185.8210	57.20782	18.20875	19.60995	18.65701
2	-213.1456	37.98185	47.75031	17.87637	20.44523	18.69817
3	-173.1854	37.29617	27.22752	16.87903	20.61555	18.07437
4	-97.46243	45.43378*	2.667429*	13.49750*	18.40169*	15.06639*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

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VAR Granger Causality/Block Exogeneity Wald Tests
Date: 09/18/16   Time: 17:28
Sample: 2007Q1 2015Q2
Included observations: 30

Dependent variable: CR

Excluded	Chi-sq	df	Prob.
FDR	9.684528	3	0.0214
LGDP	5.192048	3	0.1583
LRM	8.203674	3	0.0420
EXC	7.501600	3	0.0575
All	32.50813	12	0.0012

Dependent variable: FDR

Excluded	Chi-sq	df	Prob.
CR	5.641441	3	0.1304
LGDP	5.432781	3	0.1427
LRM	3.898878	3	0.2726
EXC	7.169164	3	0.0667
All	45.68687	12	0.0000

Dependent variable: LGDP

Excluded	Chi-sq	df	Prob.
CR	0.533156	3	0.9115
FDR	4.943908	3	0.1760
LRM	1.200600	3	0.7529
EXC	4.952386	3	0.1753
All	9.162420	12	0.6890

Dependent variable: LRM

Excluded	Chi-sq	df	Prob.
CR	19.69124	3	0.0002
FDR	5.029100	3	0.1697
LGDP	4.557985	3	0.2072
EXC	1.217402	3	0.7488
All	42.61796	12	0.0000

Dependent variable: EXC

Excluded	Chi-sq	df	Prob.
CR	5.618501	3	0.1317
FDR	2.525887	3	0.4706
LGDP	4.215528	3	0.2391
LRM	10.97944	3	0.0118
All	22.46011	12	0.0327

BAHRAIN

ARDL Cointegrating And Long Run Form
Dependent Variable: CR
Selected Model: ARDL(4, 1, 0, 3, 3, 3, 1)
Date: 09/20/16   Time: 11:56
Sample: 2007Q1 2015Q2
Included observations: 30

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CR(-1))	0.891893	0.216232	4.124702	0.0033
D(CR(-2))	0.298038	0.163365	1.824369	0.1055
D(CR(-3))	0.803232	0.158970	5.052740	0.0010
D(FDR)	24.778457	6.613734	3.746515	0.0057
D(LGDP)	-2.525890	1.595881	-1.582756	0.1521
D(LRM)	23.814653	15.630082	1.523642	0.1661
D(LRM(-1))	49.083770	3.825006	12.832337	0.0000
D(LRM(-2))	-38.762679	4.396026	-8.817663	0.0000
D(EXC)	-11433.209	4164.942	-2.745106	0.0252
D(EXC(-1))	-29845.347	4010.451	-7.441892	0.0001
D(EXC(-2))	33015.452	6036.566	5.469244	0.0006
D(IR)	0.366084	0.297133	1.232052	0.2529
D(IR(-1))	0.251480	0.397830	0.632130	0.5449
D(IR(-2))	2.273505	0.618852	3.673744	0.0063
D(INF)	2.181661	1.208817	1.804790	0.1088
CointEq(-1)	-0.558263	0.125722	-4.440442	0.0022

Cointeq = CR - (35.8551*FDR -4.5246*LGDP - 54.3697*LRM +
    34744.0787*EXC -5.8899*IR + 0.4731*INF -302.9162)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDR	35.855127	7.899713	4.538789	0.0019
LGDP	-4.524552	2.533998	-1.785539	0.1120
LRM	54.369728	21.256162	2.557834	0.0338
EXC	34744.078	10968.732	3.167556	0.0132
IR	-5.889915	1.706713	-3.451029	0.0087
INF	0.473127	0.499521	0.947162	0.3713
C	-302.916152	134.041379	-2.259870	0.0537

ARDL Bounds Test
Date: 09/19/16   Time: 18:44
Sample: 2008Q1 2015Q2
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.719188	6

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.293861	Prob. F(1,7)	0.6046
Obs*R-squared	1.248953	Prob. Chi-Square(1)	0.2638

Heteroskedasticity Test: ARCH

F-statistic	2.079554	Prob. F(1,27)	0.1608
Obs*R-squared	2.073865	Prob. Chi-Square(1)	0.1498

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CUSUM of Squares ----- 5% Significance
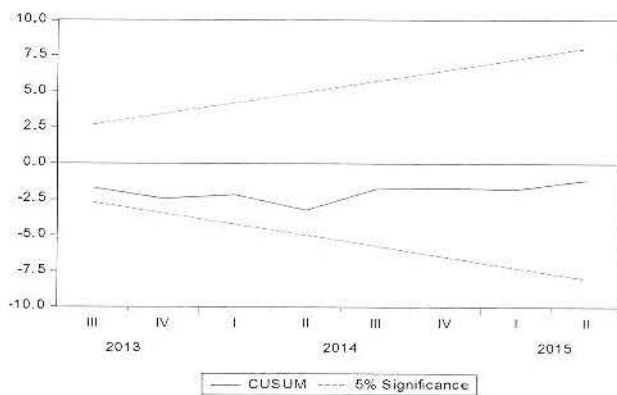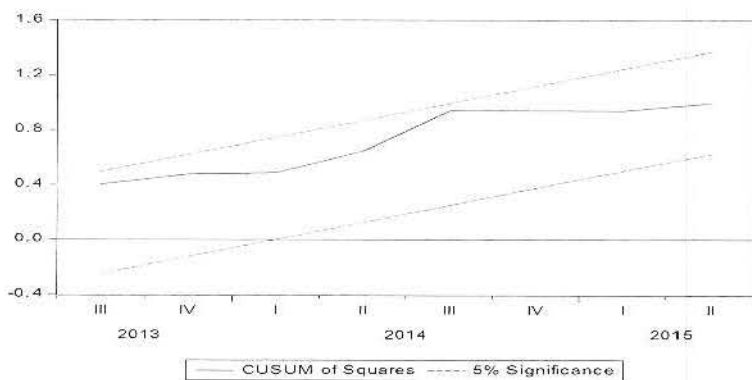
Optimum lag selection

VAR Lag Order Selection Criteria
Endogenous variables: CR FDR LGDP LRM EXC
Exogenous variables: C
Date: 09/20/16   Time: 12:07
Sample: 2007Q1 2015Q2
Included observations: 30

Lag	LogL	LR	FPE	AIC	SC	HQ
0	282.7635	NA	6.25e-15	-18.51757	-18.28403	-18.44286
1	398.8437	185.7284	1.48e-17	-24.58958	-23.18839	-24.14133
2	417.9298	24.17568	2.56e-17	-24.19532	-21.62646	-23.37352
3	450.7326	30.61594	2.35e-17	-24.71551	-20.97898	-23.52016
4	542.9341	55.32091*	7.67e-19*	-29.19561*	-24.29142*	-27.62671*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Granger Causality/Block Exogeneity Wald Tests
Date: 09/20/16   Time: 12:23
Sample: 2007Q1 2015Q2
Included observations: 31

Dependent variable: CR

Excluded	Chi-sq	df	Prob.
FDR	0.465947	2	0.7922
LGDP	2.037833	2	0.3610
LRM	8.370288	2	0.0152
EXC	8.703403	2	0.0129
All	12.82268	8	0.1181

Dependent variable: FDR

Excluded	Chi-sq	df	Prob.
CR	5.712500	2	0.0575
LGDP	0.157465	2	0.9243
LRM	2.089941	2	0.3517
EXC	5.094579	2	0.0783
All	15.33169	8	0.0530

Dependent variable: LGDP

Excluded	Chi-sq	df	Prob.
CR	8.661538	2	0.0132
FDR	0.660720	2	0.7187
LRM	6.609648	2	0.0367
EXC	2.451181	2	0.2936
All	16.02966	8	0.0420

Dependent variable: LRM

Excluded	Chi-sq	df	Prob.
CR	3.424161	2	0.1805
FDR	5.245945	2	0.0726
LGDP	0.014156	2	0.9929
EXC	1.732386	2	0.4205
All	14.41136	8	0.0717

Dependent variable: EXC

Excluded	Chi-sq	df	Prob.
CR	0.916652	2	0.6323
FDR	1.588761	2	0.4519
LGDP	0.303516	2	0.8592
LRM	0.415999	2	0.8122
All	3.129415	8	0.9260

Appendix E: Financing Concentration and Credit Risks of Islamic Banks

Malaysia

Dependent Variable: CR
Method: Dynamic Least Squares (DOLS)
Date: 09/16/16   Time: 23:07
Sample (adjusted): 2007Q3 2015Q1
Included observations: 31 after adjustments
Cointegrating equation deterministics: C @TREND
Fixed leads and lags specification (lead=1, lag=1)
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FC	10.08855	3.522291	2.864201	0.0187
IR	0.682825	0.275554	2.478013	0.0351
LRM	-3.034876	0.456992	-6.640984	0.0001
LFIN	1.779068	0.858430	2.072466	0.0681
INF	0.004663	0.021098	0.221012	0.8300
C	2.660634	9.980004	0.266597	0.7958
@TREND	-0.085100	0.031055	-2.740346	0.0228

R-squared	0.996778	Mean dependent var		1.893548
Adjusted R-squared	0.989259	S.D. dependent var		0.762861
S.E. of regression	0.079064	Sum squared resid		0.056260
Long-run variance	0.003697			

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.474740	Prob. F(1,26)	0.2355
Obs*R-squared	1.824991	Prob. Chi-Square(1)	0.1767

Heteroskedasticity Test: ARCH

F-statistic	0.469212	Prob. F(1,31)	0.4984
Obs*R-squared	0.492036	Prob. Chi-Square(1)	0.4830

INDONESIA

Dependent Variable: CR
Method: Dynamic Least Squares (DOLS)
Date: 09/16/16   Time: 23:19
Sample (adjusted): 2007Q3 2015Q1
Included observations: 31 after adjustments
Cointegrating equation deterministics: C @TREND
Fixed leads and lags specification (lead=1, lag=1)
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)
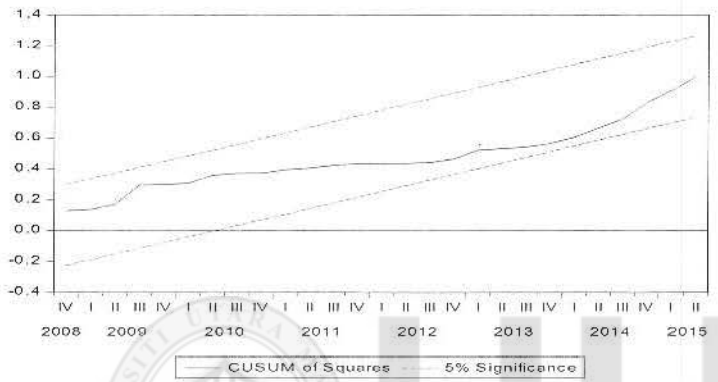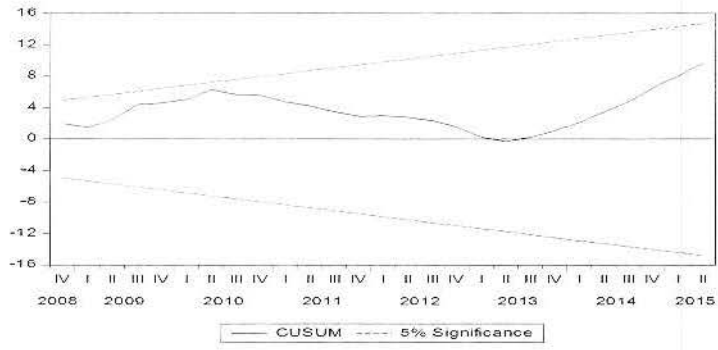
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FC	-25.05358	12.80725	-1.956203	0.0821
LRM	8.923444	11.00237	0.811048	0.4383
LFIN	4.818872	4.642913	1.037898	0.3264
IR	1.083804	0.232202	4.667499	0.0012
INF	-0.044797	0.082372	-0.543840	0.5998
C	-118.8497	61.60277	-1.929292	0.0858
@TREND	-0.554149	0.257090	-2.155466	0.0595
R-squared	0.948728	Mean dependent var		3.810323
Adjusted R-squared	0.829094	S.D. dependent var		0.950924
S.E. of regression	0.393120	Sum squared resid		1.390888
Long-run variance	0.035276			

Dependent Variable: CR

Method: Dynamic Least Squares (DOLS)
Date: 11/03/16   Time: 11:27
Sample (adjusted): 2007Q3 2014Q3
Included observations: 29 after adjustments
Cointegrating equation deterministics: C
Fixed leads and lags specification (lead=1, lag=1)
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FC	-48.43093	10.89796	-4.444036	0.0022
LRM	-320.6308	79.98482	-4.008645	0.0039
IR	0.331536	0.162411	2.041334	0.0755
INF	-0.219191	0.066480	-3.297102	0.0109
LFIN	7.432718	1.750334	4.246458	0.0028
C	-84.15039	19.25322	-4.370718	0.0024
R-squared	0.957778	Mean dependent var		3.757931
Adjusted R-squared	0.852223	S.D. dependent var		0.959514
S.E. of regression	0.368854	Sum squared resid		1.088427
Long-run variance	0.028305			

Breusch-Godfrey Serial Correlation LM Test:

|			
F-statistic	0.195457	Prob. F(2,24)	0.8238
Obs*R-squared	0.512866	Prob. Chi-Square(2)	0.7738

Date: 11/03/16   Time: 11:34
Sample: 2007Q1 2014Q4
Included observations: 29

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. |* . |	. |* . |	1	0.174	0.174	0.9676	0.325
.**| . |	.**| . |	2	-0.240	-0.279	2.8889	0.236
.**| . |	. *| . |	3	-0.239	-0.154	4.8697	0.182
. *| . |	. *| . |	4	-0.156	-0.166	5.7445	0.219
. | . |	. | . |	5	0.065	0.023	5.9011	0.316
. |* . |	. |* . |	6	0.203	0.090	7.5138	0.276
. |* . |	. |* . |	7	0.212	0.158	9.3458	0.229
. *| . |	. *| . |	8	-0.097	-0.105	9.7451	0.283
.**| . |	. *| . |	9	-0.260	-0.110	12.782	0.173
. *| . |	. *| . |	10	-0.178	-0.106	14.283	0.160
. *| . |	. *| . |	11	-0.104	-0.177	14.827	0.191
. |**. |	. |* . |	12	0.238	0.145	17.811	0.122

*Probabilities may not be valid for this equation specification.

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.658816	Prob. F(5,26)	0.6577
Obs*R-squared	3.598358	Prob. Chi-Square(5)	0.6086
Scaled explained SS	2.344561	Prob. Chi-Square(5)	0.7997
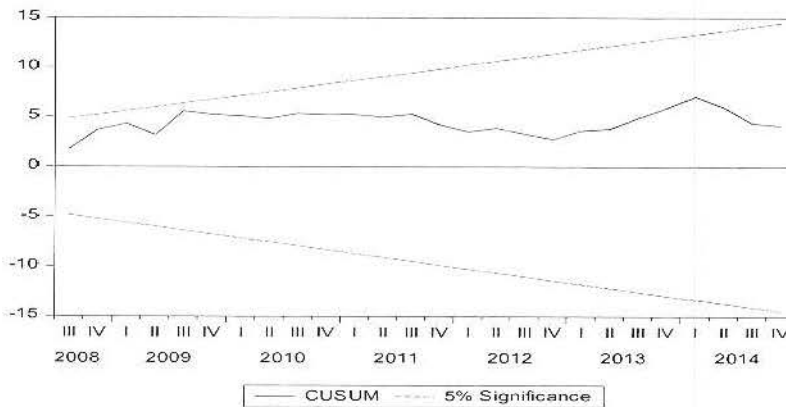
Dynamic OLS

Dependent Variable: CR
Method: Least Squares
Date: 09/16/16   Time: 23:57
Sample: 2007Q1 2015Q2
Included observations: 34

| Variable	Coefficient	Std. Error	t-Statistic	Prob.
FC	-19.76850	5.282094	-3.742550	0.0008
IR	0.336505	0.176211	1.909666	0.0661
LRM	0.689419	0.532410	1.294904	0.2056
INF	-0.032424	0.048183	-0.672943	0.5063
C	-1.145302	6.361547	-0.180035	0.8584

R-squared	0.699653	Mean dependent var	3.964118
Adjusted R-squared	0.658226	S.D. dependent var	1.052631
S.E. of regression	0.615383	Akaike info criterion	2.001908
Sum squared resid	10.98218	Schwarz criterion	2.226373
Log likelihood	-29.03244	Hannan-Quinn criteria.	2.078457
F-statistic	16.88878	Durbin-Watson stat	1.708438
Prob(F-statistic)	0.000000		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.562238	Prob. F(1,28)	0.4596
Obs*R-squared	0.669279	Prob. Chi-Square(1)	0.4133

Heteroskedasticity Test: ARCH

F-statistic	1.531621	Prob. F(1,31)	0.2252
Obs*R-squared	1.553673	Prob. Chi-Square(1)	0.2126
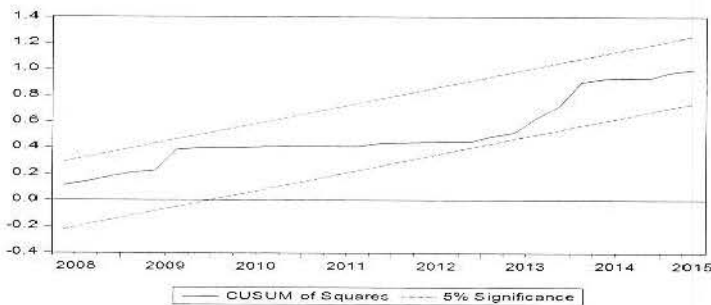
BAHRAIN

CORRELATION BETWEEN CR AND FC

Covariance Analysis: Ordinary
Date: 05/21/16   Time: 11:54
Sample: 2013S1 2014S2
Included observations: 4

Covariance Correlation	CR	FC
CR	0.635000	
	1.000000	
FC	0.004966	3.92E-05
	0.995522	1.000000

BAHRAIN

(Dynamic OLS Result)

Dependent Variable: CR
Method: Dynamic Least Squares (DOLS)
Date: 11/13/16   Time: 15:34
Sample (adjusted): 2008Q1 2015Q1
Included observations: 29 after adjustments
Cointegrating equation deterministics: C
Fixed leads and lags specification (lead=1, lag=3)
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFIN	31.09764	15.78653	1.969884	0.1202
INF	-2.854928	0.759593	-3.758499	0.0198
IR	-15.32258	4.581053	-3.344773	0.0287
LRM	-89.14322	35.11548	-2.538573	0.0641
C	188.0885	94.82544	1.983523	0.1183

|			
R-squared	0.995911	Mean dependent var	10.47931
Adjusted R-squared	0.971380	S.D. dependent var	4.204112
S.E. of regression	0.711233	Sum squared resid	2.023408
Long-run variance	0.295908		

DIAGNOSTIC TEST

Serial correlation test

Date: 11/13/16   Time: 15:11
Sample: 2007Q1 2015Q2
Included observations: 29

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
.**| . |	.**| . |	1	-0.251	-0.251	2.0300	0.154
. |* . |	. |* . |	2	0.200	0.146	3.3565	0.187
. | . |	. | . |	3	-0.028	0.056	3.3832	0.336
. | . |	. | . |	4	-0.002	-0.028	3.3834	0.496
. *| . |	. *| . |	5	-0.074	-0.095	3.5893	0.610
. |* . |	. | . |	6	0.088	0.065	3.8904	0.692
. *| . |	. | . |	7	-0.110	-0.052	4.3846	0.735
. | . |	. | . |	8	0.039	-0.024	4.4487	0.815
. | . |	. |* . |	9	0.047	0.080	4.5488	0.872
. *| . |	. *| . |	10	-0.122	-0.105	5.2529	0.874
. |**. |	. |* . |	11	0.236	0.191	8.0358	0.710

*Probabilities may not be valid for this equation specification.

CUSUM ----- 5% Significance

CUSUM of Squares ----- 5% Significance

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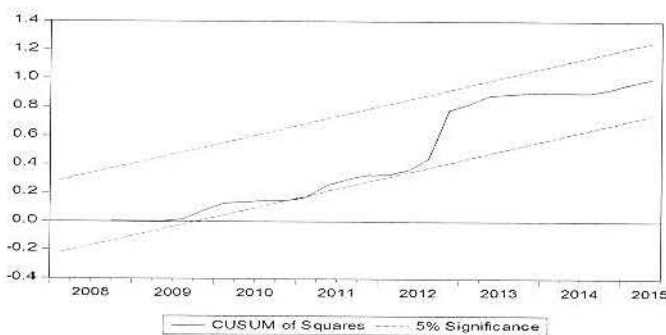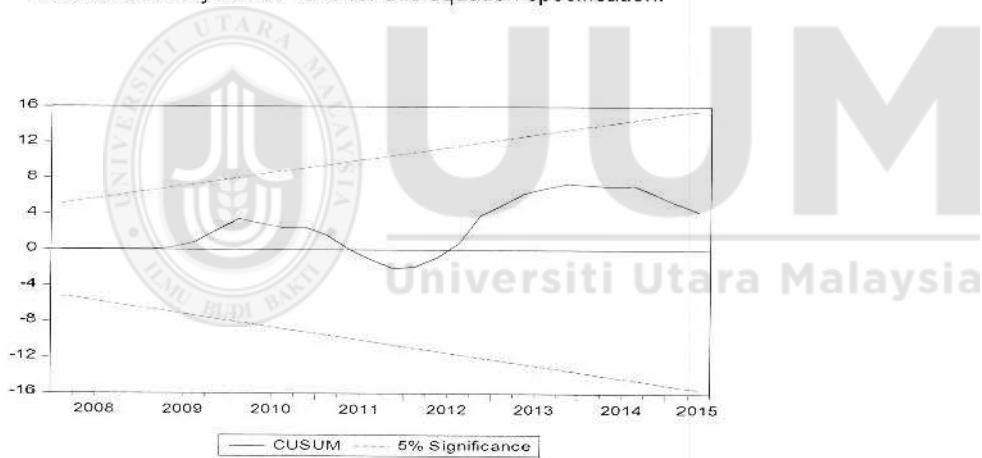
APPENDIX F: Lists of Islamic Banks

Malaysia:

1. Affin Islamic Bank Berhad

2. Al Rajhi Banking & Investment Corporation (Malaysia) Berhad

3. Alliance Islamic Bank Berhad

4. AmIslamic Bank Berhad

5. Asian Finance Bank Berhad

6. Bank Islam Malaysia Berhad

7. Bank Muamalat Malaysia Berhad

8. CIMB Islamic Bank Berhad

9. Hong Leong Islamic Bank Berhad

10. HSBC Amanah Malaysia Berhad

11. Kuwait Finance House (Malaysia) Berhad

12. Maybank Islamic Berhad

13. OCBC Al-Amin Bank Berhad

14. Public Islamic Bank Berhad

15. RHB Islamic Bank Berhad

16. Standard Chartered Saadiq Berhad

Source: Bank Negara Malaysia's Monthly Statistical Bulletin

Appendix F ctd

Indonesia:

1. PT. Bank Muamalat Indonesia

2. PT. Bank Victoria Syariah

3. Bank BRI Syariah

4. B.P.D. Jawa Barat Banten Syariah

5. Bank BNI Syariah

6. Bank Syariah Mandiri

7. Bank Syariah Mega Indonesia

8. Bank Panin Syariah

9. PT. Bank Syariah Bukopin

10. PT. BCA Syariah

11. PT. Maybank Syariah Indonesia

12. PT. Bank Tabungan Pensiuanan National Syariah

Source: Bank Indonesia's Statistical Bulletin

Appendix F Ctd: Bahrain

1. Al Barak Islamic Bank B.S.C. (c)

2. Al Salam Bank Bahrain B.S.C.

3. Bahrain Islamic Bank B.S.C.

4. Ithmaar Bank B.S.C.

5. Khaleej Commercial Bank B.S.C.

6. Kuwait Finance House (Bahrain) B.S.C.

7. ABC Islamic Bank (E.C.)

8. Al Baraka Banking Group B.S.C.

9. Arab Islamic Bank (E.C.)

10. Bank Al-Khair B.S.C.

11. Citi Islamic Investment Bank (E.C.)

12. First Energy Bank B.S.C.

13. Global Banking Corporation B.S.C

14. Gulf Finance House B.S.C.

15. Ibdaar Bank B.S.C.

16. International Investment Bank B.S.C.

17. Investment Dar Bank B.S.C.

18. Investors Bank B.S.C.

19. Kuwait Turkish Participation Bank Inc.

20. Liquidity Management Centre B.S.C. (c)

21. R A Bahrain B.S.C. (c)

22. Seera Investment Bank B.S.C. (c)

23. Turkiye Finans Katilim Banakasi A.S.

24. Venture Capital Bank B.S.C. (c)

Source: Central Bank Of Bahrain Statistical Bulletin.